

Appl. No. : 10/658,307  
Filed : September 9, 2003

### AMENDMENTS TO THE SPECIFICATION

Please delete the paragraph at page 42, lines 6-9 and replace it with the following new paragraph:

To make testing samples, this powdery residue mixture was put on a slide glass and melted at 125°C to make a 200-300  $\mu\text{m}$  thickness film, or pre-cake. Small portions of this pre-cake were taken off and sandwiched between indium tin oxide (ITO) coated glass plates separated by a 105  $\mu\text{m}$  spacer to form the individual samples.

Please delete the paragraph at page 42, lines 12-16 and replace it with the following new paragraph:

The diffraction efficiency was measured at 633 nm by four-wave mixing experiments. Steady-state and transient four-wave mixing experiments were done using two writing beams making an angle of 20.5 degree in air; with the bisector of the writing beams making an angle of 60 degree relative to the sample normal. The resulting grating period for this geometry was 3.1  $\mu\text{m}$ ; the grating vector was directed at 60 degree relative to the sample normal.

Please delete the paragraph at page 42, lines 17-23 and replace it with the following new paragraph:

For the four-wave mixing experiments, two s-polarized writing beams with equal intensity of 0.12 W/cm<sup>2</sup> in the sample were used; the spot diameter was 600  $\mu\text{m}$ . A p-polarized beam of 1.7 mW/cm<sup>2</sup> counter propagating with respect to the writing beam nearest to the surface normal was used to probe the diffraction gratings; the spot diameter of the probe beam in the sample was 500  $\mu\text{m}$ . The diffracted and the transmitted probe beam intensities were monitored to determine the diffraction efficiency. The results are given in Table 1.

Please delete the paragraph at page 42, line 26 to page 43, line 8 and replace it with the following new paragraph:

The diffraction efficiency was measured as a function of the applied field, using a procedure similar to that described in Measurement 1, by four-wave mixing experiments at 633

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nm with s-polarized writing beams and a p-polarized probe beam. The angle between the bisector of the two writing beams and the sample normal was 60 degree and the angle between the writing beams was adjusted to provide a  $3.1 \mu\text{m}$  grating spacing in the material ( $\sim 20$  degree). The writing beams had equal optical powers of  $0.45 \text{ mW/cm}^2$ , leading to a total optical power of  $0.5 \text{ mW}$  on the polymer, after correction for reflection losses. The beams were collimated to a spot size of approximately  $500 \mu\text{m}$ . The optical power of the probe was  $4 \text{ mW}$ . The measurement of the grating buildup time was done as follows: an electric field of  $40 \text{ V/m}$  was applied to the sample, and the sample was illuminated with one of the two writing beams and the probe beam for  $100 \text{ ms}$ . Then, the evolution of the diffracted beam was recorded. The response time was estimated as the time required to reach half of steady-state diffraction efficiency.